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Security Council

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Letter dated 16 June 2011 from the Secretary-General addressed to the President of the Security Council

I have the honour to bring to your attention the communication annexed hereto dated 9 June 2011 from Mr. Yukiya Amano, Director General of the International Atomic Energy Agency (IAEA), concerning implementation of the Safeguards Agreement between the Syrian Arab Republic and IAEA pursuant to the Treaty on the Non-Proliferation of Nuclear Weapons (see annex).

I would be grateful if you would bring the present letter and its annex to the attention of the members of the Security Council.

(*Signed*) **BAN** Ki-moon

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Annex

[Original: English]

I have the honour to refer to the implementation of the Safeguards Agreement between the Syrian Arab Republic and the International Atomic Energy Agency (IAEA) pursuant to the Treaty on the Non-Proliferation of Nuclear Weapons.

In paragraph 1 of its resolution GOV/2011/41, dated 9 June 2011 (see enclosure 1), the Board of Governors found the Syrian Arab Republic to be in non-compliance with its obligations under its Safeguards Agreement with IAEA in the context of article XII.C of the IAEA Statute. In paragraph 3 of that resolution, the Board decided, inter alia, to report Syria's non-compliance with its Safeguards Agreement to the Security Council and General Assembly of the United Nations. In the same paragraph, the Board also decided to provide to the Security Council all reports prepared by the Director General related to this issue (see enclosures 2 and 3).

I should be grateful if you would bring the present letter and, as appropriate, its enclosures to the attention of all members of the Security Council and of the General Assembly.*

(*Signed*) Yukiya **Amano**

* In addition to the report of the Director General of the International Atomic Energy Agency (IAEA) (GOV/2011/30) reproduced herewith, reports GOV/2008/60, GOV/2009/9, GOV/2009/36, GOV/2009/56, GOV/2009/75, GOV/2010/11, GOV/2010/29, GOV/2010/47, GOV/2010/63 and GOV/2011/8 were also brought to the attention of the members of the Security Council. Those reports are available from www.iaea.org/.

Enclosure 1

Implementation of the NPT safeguards agreement in the Syrian Arab Republic

Resolution adopted by the Board of Governors on 9 June 2011

The Board of Governors,

(a) Noting the Director General's May 24, 2011 report (GOV/2011/30) on the implementation of the NPT Safeguards Agreement in the Syrian Arab Republic, and previous reports by the Director General regarding Syria (GOV/2008/60, GOV/2009/9, GOV/2009/36, GOV/2009/56, GOV/2009/75, GOV/2010/11, GOV/2010/29, GOV/2010/47, GOV/2010/63, and GOV/2011/8),

(b) Recalling that Syria undertook to accept safeguards, in accordance with its comprehensive Safeguards Agreement (INFCIRC/407) concluded pursuant to Article III of the Treaty on the Non-Proliferation of Nuclear Weapons (NPT), on all source or special fissionable material in all peaceful nuclear activities within its territory, under its jurisdiction, or carried out under its control anywhere,

(c) Noting that the Director General in his latest report to the Board expressed regret that information concerning the Dair Alzour site was not provided to the Agency in a timely manner and that force was used before the Agency was given an opportunity to establish the facts in accordance with its responsibilities under Syria's Safeguards Agreement,

(d) Commending the Director General and the Secretariat for their professional and impartial efforts to implement the Safeguards Agreement in Syria and to resolve outstanding safeguards issues in Syria,

(e) Noting with serious concern that Syria's statements concerning the destroyed building at Dair Alzour are limited in detail, are not supported by documentation and have not allowed the Agency to confirm Syria's assertions regarding the non-nuclear nature of the building,

(f) Noting with serious concern Syria's lack of cooperation with the IAEA Director General's repeated requests for access to additional information and locations as well as Syria's refusal to engage substantively with the Agency on the nature of the Dair Alzour site since the Agency's June 2008 visit,

(g) Noting with serious concern the conclusion of the Agency that, notwithstanding the loss of information, and after considering Syria's response to allegations of an undeclared reactor and all relevant information available to the Agency, the building destroyed at the Dair Alzour site in September 2007 was very likely a nuclear reactor and should have been declared by Syria pursuant to Articles 41 and 42 of its Safeguards Agreement and Code 3.1 of the General Part of the Subsidiary Arrangements thereto,

(h) Mindful that the history of concealment of Syria's nuclear activities referred to in the Director General's reports, the nature of these activities, including the presence of a significant number of particles of anthropogenic natural uranium at the Dair Alzour site, procurement activities, and the resulting absence of confidence that Syria's nuclear program is exclusively for peaceful purposes, have given rise to concerns regarding the maintenance of international peace and security, and

(i) Noting that the Director General has repeatedly urged Syria to bring into force an Additional Protocol to its Safeguards Agreement, which would further facilitate the Agency's work in verifying the correctness and completeness of Syria's declarations,

1. Finds, based on the report of the Director General, that Syria's undeclared construction of a nuclear reactor at Dair Alzour and failure to provide design information for the facility in accordance with Code 3.1 of Syria's Subsidiary Arrangements are a breach of Articles 41 and 42 of Syria's NPT Safeguards Agreement, and constitute non-compliance with its obligations under its Safeguards Agreement with the Agency in the context of Article XII.C of the Agency's Statute;

2. Calls upon Syria to remedy urgently its non-compliance with its Safeguards Agreement and fulfill its May 26 pledge to the Director General by responding positively and without delay to the Director General's requests for updated reporting from Syria under its Safeguards Agreement and access to all information, sites, material and persons necessary for the Agency to verify such reporting and resolve all outstanding questions so that the Agency can provide the necessary assurances as to the exclusively peaceful nature of Syria's nuclear program pursuant to Syria's Safeguards Agreement;

3. Decides to report, as provided for in Article XII.C of the Statute, through the Director General, Syria's non-compliance with its Safeguards Agreement to all Members of the Agency and to the Security Council and General Assembly of the United Nations, to provide to the Security Council all reports prepared by the Director General related to the issue, and to make the text of this resolution as well as all previous reports on this issue available to the public;

4. Calls upon Syria to sign and promptly bring into force and implement in full the Additional Protocol and, pending that, to act in accordance with the Additional Protocol so that the Director General can provide the necessary assurances regarding both the correctness and completeness of Syria's declarations pursuant to its safeguards agreement;

5. Requests the Director General to continue his efforts to implement fully the Agency's safeguards agreement with Syria and to report any significant developments to the Board and to the Security Council of the United Nations, as appropriate; and

6. Decides to remain seized of the matter.

Enclosure 2

Implementation of the NPT Safeguards Agreement in the Syrian Arab Republic

Report by the Director General

1. This report of the Director General to the Board of Governors is on the implementation of the NPT Safeguards Agreement in the Syrian Arab Republic[1] (Syria). It includes the Agency's assessment of the nature of the destroyed building at the Dair Alzour site.

A. The Dair Alzour Site

2. On 2 June 2008, the Director General informed the Board of Governors that the Agency had been provided with information alleging that an installation at the Dair Alzour site in Syria, destroyed by Israel in September 2007, had been a nuclear reactor that was not yet operational and into which no nuclear material had been introduced. Information subsequently provided to the Agency further alleged that the reactor was a gas cooled graphite moderated reactor, that it was not configured to produce electricity, that it had been built with the assistance of the Democratic People's Republic of Korea (DPRK), and that there were three other locations in Syria that were functionally related to the Dair Alzour site. By the end of October 2007, large scale clearing and levelling operations had taken place at the site which had removed or obscured the remains of the destroyed building.[2] Syria has maintained, since May 2008, that the destroyed building was a non-nuclear military installation and that Syria had had no nuclear related cooperation with the DPRK.[3]

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[1] INFCIRC/407

[2] GOV/OR.1206, para. 26; GOV/2008/60, para. 16

[3] GOV/2008/60, para. 1; GOV/2009/36, para. 15

3. The Agency regrets that information concerning the Dair Alzour site was not provided to it in a timely manner and that force was used before the Agency was given an opportunity to establish the facts in accordance with its responsibilities under Syria's Safeguards Agreement.

4. In June 2008, during the Agency's visit to Syria, the Agency requested supporting documentation concerning the past and current use of the buildings at the Dair Alzour site and at three other locations allegedly functionally related to that site. The Agency also requested clarification about procurement activities by Syrian entities, including the Syrian Atomic Energy Agency (AECS), concerning pumping equipment, and large quantities of graphite and barite. During the visit, Syria stated that the function of the destroyed building was missile related. Syria also stated that the destroyed building could not have been a nuclear facility because of the unreliable and insufficient electricity supplies in the area, the limited availability of human resources in Syria and the unavailability of large quantities of treated water.

5. Environmental samples taken during the visit to the Dair Alzour site in June 2008 contained particles of anthropogenic natural uranium, graphite and stainless steel. Syria maintains that the particles of anthropogenic natural uranium found at the Dair Alzour site originated from the missiles used to destroy the building.[4] Syria also maintains that the pumping equipment and large quantities of graphite and barite that it sought to procure were for civilian and non-nuclear purposes.

6. Syria's statements — concerning the nature of the destroyed building, the Dair Alzour site, the three other locations allegedly functionally related to it, the procurement activities referred to above and the alleged foreign assistance — are limited in detail, are not supported by documentation and have not allowed the Agency to confirm Syria's assertions regarding the non-nuclear nature of the destroyed building. Since the Agency's visit to the Dair Alzour site in June 2008, the Agency has made repeated requests to Syria for:

- information concerning the Dair Alzour site, the infrastructure observed at the site and certain procurement efforts which Syria has stated were related to civilian non-nuclear activities;
- access to technical documentation and any other information related to the construction of the destroyed building;
- access to locations where the debris from the destroyed building, the remains of munitions, the debris from equipment and any salvaged equipment had been and/or are now situated; and
- further access to the Dair Alzour site and access to three other locations allegedly functionally related to the Dair Alzour site.

7. Syria has maintained that, due to the military and non-nuclear nature of the Dair Alzour site and three other locations allegedly functionally related to the Dair Alzour site, it has no obligation to provide more information under its Safeguards Agreement with the Agency.[5] The Agency has explained to Syria that there is no limitation in comprehensive safeguards agreements on Agency access to information, activities or locations simply because they may be military related. The Agency has repeatedly offered to establish the necessary modalities to enable Syria to substantiate its statements while protecting sensitive information related to its activities at the Dair Alzour site and the three other locations.

[4] GOV/2008/60, para. 8. In this context, it is noted that no additional information has been provided by Israel.

[5] GOV/2009/56, para. 9; GOV/2008/60, para. 14.

8. In a letter dated 18 November 2010, the Director General wrote to H.E. Walid Al-Moualem, Syria's Minister for Foreign Affairs, to request, inter alia, that Syria provide the Agency with prompt access to information and locations previously indicated by the Agency.

9. In a letter dated 6 February 2011 addressed to the Director General, Syria's Minister for Foreign Affairs stated that the Director General of the AECS would continue to work with the Agency to resolve all outstanding technical issues in accordance with Syria's commitments under the Agency's Statute, the Treaty on the Non-Proliferation of Nuclear Weapons and Syria's Safeguards Agreement.

10. Notwithstanding the Minister's statement referred to above, Syria has not engaged substantively with the Agency on the nature of the Dair Alzour site since the Agency's June 2008 visit and, since August 2009, has not responded to the other issues referred to in paragraph 6 above.

B. Assessment of the Dair Alzour Site

11. As further described below, the Agency has assessed that:

- features of the destroyed building are comparable to those of gas cooled graphite moderated reactors of the type and size alleged;
- prior to the bombing, the configuration of the infrastructure at the site, including its connections for cooling and treated water, was able to support the operation of such a reactor and was not consistent with Syria's claims regarding the purpose of the infrastructure; in addition, a number of other features of the site add to its suitability for the construction and operation of a nuclear reactor;
- analysis of samples from the site indicates a connection to nuclear related activities; and
- the features of the destroyed building and the site could not have served the purpose claimed by Syria.

B.1. Features of the Destroyed Building

12. The Agency has assessed that the dimensions, shape and configuration of the destroyed building are comparable to those found in reactors of the alleged type.

13. Based on commercial imagery from 2001 to 2007, the dimensions of the building[6] are comparable to those for nuclear reactors of the type and power alleged, i.e. similar to the 25 MW(th) gas cooled graphite moderated reactor at Yongbyon[7] in the DPRK. The Agency's analysis of a photograph of the bombed building that was provided to the Agency by a Member State corroborates the allegation that Syria attempted to conceal the features of the building's configuration by the addition of wall and roof sections.

14. Analysis of imagery provided by two Member States, taken shortly after the building was destroyed, indicates that internal features of the building correspond to a large central hall, a

[6] The assessment of the dimensions of the destroyed building takes into account the considerable portion of the building that was constructed below ground level.

[7] Officially referred to as the 5 MW(e) Experimental Nuclear Power Plant Number 1.

cylindrical biological shield, a containment structure, heat exchanger shielding structures and a spent fuel pond; all of which would be required for a reactor.[8] The Agency procured a radar image of the building taken shortly after its destruction. Within the limits of the resolution, the image is consistent with those provided to the Agency by the two Member States.

15. The imagery of the destroyed building showed that the feature interpreted as being a containment structure had similar dimensions, shape and layout to other known reactors of the type alleged, and the overall size of the building was sufficient to house the equipment needed for such a nuclear reactor. Photographs of a reactor vessel at the Dair Alzour site released by a Member State simultaneously with the publication of the allegations are not inconsistent with the Agency's assessment of the dimensions of the containment structure. Based on all the information available to the Agency, including the Agency's analysis of these photographs, it is estimated that the reactor core had 843 fuel channels and 79 access ports, and, depending on the heat transfer characteristics of the fuel, the reactor may have had a thermal power of 25 MW or higher.

16. During the June 2008 Agency visit, Syria stated that some equipment which remained functional after the bombing had been removed from the destroyed building. Satellite imagery provided by a Member State confirms Syria's efforts to recover equipment and material from the destroyed building prior to its complete demolition and burial. The efforts included the covering of areas of the destroyed building which may have served to conceal features of the facility during the process. A significant fraction of material and equipment had been removed from the site before the remainder was demolished and buried in the seven weeks following the bombing.

B.2. Site Infrastructure and Site Suitability

17. Based on satellite imagery and the Agency's observations made during the June 2008 visit, the Agency has assessed that the configuration and capacity of the infrastructure at the site prior to the destruction of the building were consistent with the cooling requirements of a 25 MW(th) nuclear reactor. Syria claims that the pumps at the river pump house (RPH) and the Dair Alzour site pump house (SPH) comprised a staged pumping system to supply river water to the civilian water treatment facility (WTF) located approximately 5 km to the east of the Dair Alzour site. Syria's claims in this respect are not supported by the Agency's assessment (see Figure 1 below). Factors considered in the Agency's assessment include:

- Before the destruction of the building, the river water pumping system had the necessary pipes to supply the building with river water. A pipe ran from the building to a point downstream from the RPH. This configuration was consistent with the supply of cooling water to a reactor and the return of water to the river;
- The observed pumping capacity was adequate for cooling 25 MW of thermal power. Additionally, the stated function of the destroyed building (i.e. missile related) would not require connection to the observed river water pumping capacity;
- Before the destruction of the building, the river water pumping system's output was not connected to the WTF; and

[8] The Agency notes that there is a variety in the configuration of known examples of this type of reactor, some with partial underground construction, cooling without cooling towers, different core sizes and different placement of spent fuel ponds. The configuration of the destroyed building falls within this variety of configurations.

- After the destruction of the building, Syria reconfigured the pumping infrastructure to remove sections of the return pipe and to install a new large diameter water pipe connection from the SPH to the WTF

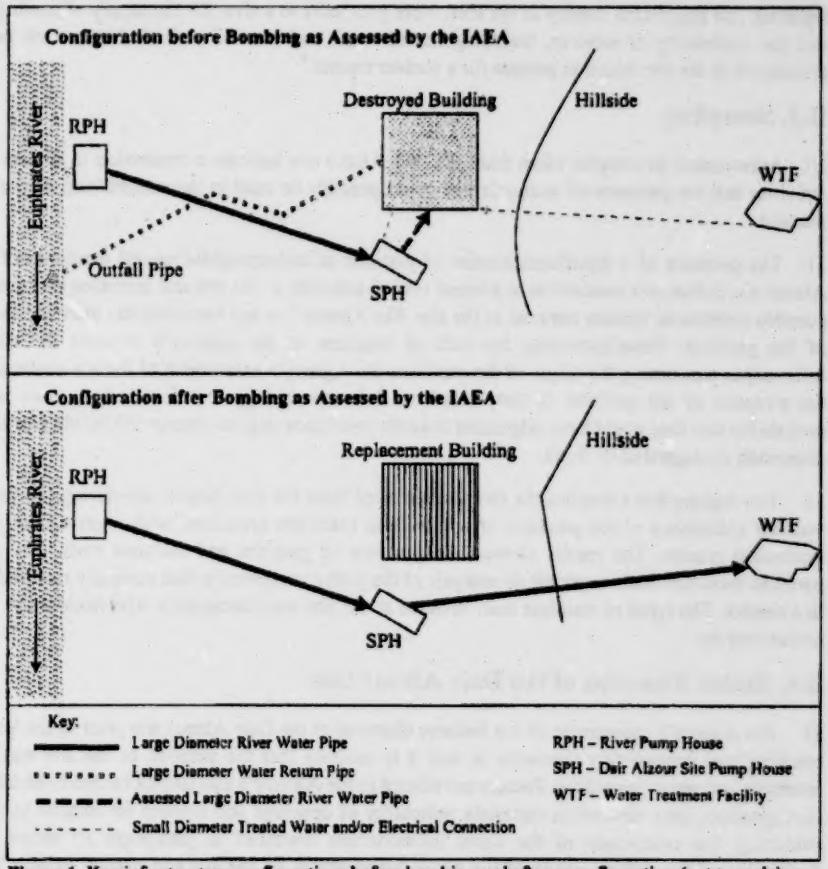

Figure 1. Key infrastructure configurations before bombing and after reconfiguration (not to scale)

18. In contrast to Syria's statements concerning insufficient electricity supplies in the area, the site infrastructure included buried high voltage power distribution and transformer equipment. At the time of the Agency's June 2008 visit, the Agency observed electrical infrastructure and the operation of all the river water pumps at the RPH and SPH. The combined electrical load of the pumps represents a significant fraction of the total electrical power requirement for operation of a reactor of the alleged type. Therefore, the Agency has assessed that the electrical infrastructure at the site was possibly sufficient to meet the needs of such a nuclear reactor.

19. Based on the available information, including 1994 AECS seismology data centred on the Dair Alzour site and 2002 geology data concerning the Dair Alzour region, the site has a number of other features which add to its suitability for the construction and operation of a nuclear reactor. These features of the site include a relatively stable geological platform on which to construct a heavy building, low population density in the area, close proximity to a river for the supply of cooling water, and the availability of services, including treated water and electricity. Such features are normally considered in the site selection process for a nuclear reactor.[9]

B.3. Sampling

20. Assessments of samples taken from the Dair Alzour site indicate a connection to nuclear related activities and the presence of materials that could possibly be used in the construction of gas cooled reactors.

21. The presence of a significant number of particles of anthropogenic natural uranium at the Dair Alzour site indicates a connection to nuclear related activities at the site and increases concerns about possible undeclared nuclear material at the site. The Agency has not been able to determine the origin of the particles. Notwithstanding the lack of response to the Agency's requests for additional information concerning the origin of the particles, the Agency's assessment of Syria's explanation for the presence of the particles is that, based on their morphology and distribution, there is a low probability that they could have originated from the munitions used to destroy the building or by aerial dispersion as suggested by Syria.

22. The Agency has examined the samples retrieved from the Dair Alzour site during the June 2008 visit for indications of the presence of construction materials associated with a gas cooled graphite moderated reactor. The results showed the presence of graphite and stainless steel. The graphite particles were too small to permit an analysis of the purity compared to that normally required for use in a reactor. The types of stainless steel detected at the site were compatible with nuclear use, but not exclusively so.

B.4. Stated Function of the Dair Alzour Site

23. The Agency's assessment of the features observed at the Dair Alzour site prior to the building's bombing and immediately thereafter is that it is unlikely that the purpose of the site was missile assembly, storage or launching. Factors considered in the Agency's assessment included the building's configuration, the construction materials, suitability of openings and hatches for missile handling or launching, the assessment of the water infrastructure described in paragraph 17 above, Syria's declaration of the civilian nature of the water infrastructure on the site and normal missile handling practices.

B.5. Assessment Summary

24. The circumstances relating to the Dair Alzour site are unique, in that the building on the site has been destroyed, the debris from the site has been cleared, several years have now passed, and Syria has not provided the necessary cooperation required by the Agency, as detailed in this report and previous reports. Notwithstanding the loss of substantial information, after considering the initial allegations and Syria's responses thereto, and considering all information available to the Agency, the Agency

[9] IAEA Safety Standards Series, No. NS-R-3, "Site Evaluation for Nuclear Installations"; IAEA Nuclear Energy Series, No. NG-G-3.1, "Milestones in the Development of a National Infrastructure for Nuclear Power".

concludes that the destroyed building was very likely a nuclear reactor[10] and should have been declared by Syria pursuant to Articles 42 and 43 of its Safeguards Agreement and Code 3.1 of the General Part of the Subsidiary Arrangements thereto.

C. Other Activities and Locations Possibly Related to the Dair Alzour Site

25. The Agency does not have sufficient information to provide any assessment concerning the function or operational status of the three other locations that are alleged to be functionally related to the Dair Alzour site.

26. Large quantities of barite were purchased by the AECS between 2002 and 2006. Syria has stated that the material was to be used for shielded radiation therapy rooms at hospitals, without providing any supporting information.[11] However, the end use of the barite as stated in the actual shipping documentation indicates that the material was intended for acid filtration. Additionally, the delivery of the barite was stopped at the request of the AECS after the destruction of the building at the Dair Alzour site and the remaining quantity was left undelivered. Given that barite is frequently used to improve radiation shielding properties of concrete, and the inconsistency concerning the end use of the barite and the involvement of the AECS in its procurement, the Agency cannot exclude the possibility that barite may have been intended for use in the construction of shielded spaces for purposes linked to nuclear fuel cycle related facilities.

D. Activities at Other Locations in Syria

27. As previously reported, particles of anthropogenic uranium of a type not included in Syria's reported inventory were found at the Miniature Neutron Source Reactor (MNSR) in 2008 and in 2009. Syria's initial explanations in June 2009 that the particles had originated either from standard reference materials used in neutron activation analysis or from a shielded transport container were not supported by the results of sampling carried out by the Agency.[12] During the November 2009 inspection, and contrary to its earlier statements, Syria explained that the anthropogenic particles had originated from previously unreported activities performed at the MNSR related to the preparation of tens of grams of uranyl nitrate using yellowcake produced at Homs.[13] At the March 2010 physical

[10] Since the early years of implementation of comprehensive safeguards by the Agency, it has been recognized that securing absolute proof of compliance (or otherwise) of a State with the terms of its Safeguards Agreement is not possible, and that "reasonable" inferences must be drawn in making conclusions, taking into account all the available information (GOV/2107, para. 3(2); GOV/2863, paras 31 and 32).

[11] GOV/2009/36, para. 14; GOV/2009/56, para. 5.

[12] GOV/2009/75, para. 6.

[13] A pilot plant for the purification of phosphoric acid was constructed and commissioned in 1997 at Homs, Syria, with the support of the United Nations Development Programme and the IAEA. Yellowcake was also produced as a result of the acid purification process. During a July 2004 visit to the Homs phosphoric acid purification plant, Agency inspectors observed some hundreds of kilograms of yellowcake.

inventory verification (PIV), another small quantity of undeclared uranyl nitrate was identified by the Agency at the MNSR. Syria explained that the unreported activities had taken place in a different location in the MNSR than previously declared to the Agency.[14] As reported earlier, Syria submitted inventory change reports in June 2010 for the newly declared material shown to the Agency during the PIV. However, inconsistencies between Syria's declarations and the Agency's findings remained unresolved at that stage.

28. As previously reported, during a meeting on 3 September 2010 to resolve the inconsistencies, agreement was reached with Syria on a plan of action which included, inter alia, actions related to the amounts and use of nuclear material at the MNSR, scientific publications concerning uranium conversion experiments different from those declared by Syria to have occurred at the MNSR, indications of nuclear material under the control of the Waste Management Department of the AECS, and the Agency's requests for access to Homs. Syria's initial response to the plan of action did not provide the necessary clarifications.[15]

29. On 8 March 2011, the arrangements for a visit to Homs by the Agency on 1 April 2011 were finalized. The Agency visited the Phosphoric Acid Pilot Plant and associated locations on that date and performed all of its planned sampling and other activities. The Agency took environmental samples from specified locations and destructive analysis samples from specific batches of the yellowcake by-product of the phosphoric acid purification. The AECS provided some documentation requested by the Agency and made arrangements for relevant research staff to be present for the discussion of the uranium conversion experiments indicated in paragraph 28 above.

30. Analytical results from the samples taken during the visit to Homs are not inconsistent with Syria's statements concerning the origin of the uranyl nitrate prepared during experiments at the MNSR and the origin of the anthropogenic natural uranium particles found at the MNSR.

31. On 19 April 2011, the Agency carried out a PIV at the MNSR where routine verification activities were performed, including the verification of previously undeclared waste material.[16]

32. Based on the information provided by Syria, and the results of the Agency's verification activities, the Agency has concluded that Syria's statements concerning the origin of the anthropogenic uranium particles found at the MNSR are not inconsistent with the Agency's findings. Therefore, the matter will be addressed in the routine implementation of safeguards.

E. Conclusion

33. The Agency regrets that Syria has not cooperated since June 2008 in connection with the unresolved issues related to the Dair Alzour site and the three other locations allegedly functionally related to it. Based on all the information available to the Agency and its technical evaluation of that information, the Agency assesses that it is very likely that the building destroyed at the Dair Alzour site was a nuclear reactor which should have been declared to the Agency. Concerning the three other

[14] GOV/2010/47, para. 10.

[15] GOV/2010/63, paras 10, 11 and 12.

[16] GOV/2010/63, para. 12.

locations, the Agency is unable to provide any assessment concerning their nature or operational status.

34. Concerning the MNSR, Syria has cooperated with the Agency by providing the requested access to Homs. Syria's statements concerning the previously unreported conversion activities at the MNSR and origin of the anthropogenic uranium particles found at the MNSR are not inconsistent with the results of the Agency's verification activities. The matter will be addressed in the routine implementation of safeguards

Enclosure 3

Implementation of the NPT Safeguards Agreement in the Syrian Arab Republic

Report by the Director General

In paragraph 24, replace "Articles 42 and 43" with "Articles 41 and 42".